ANCIENT EGYPT

1928. DECEMBER. PART IV.

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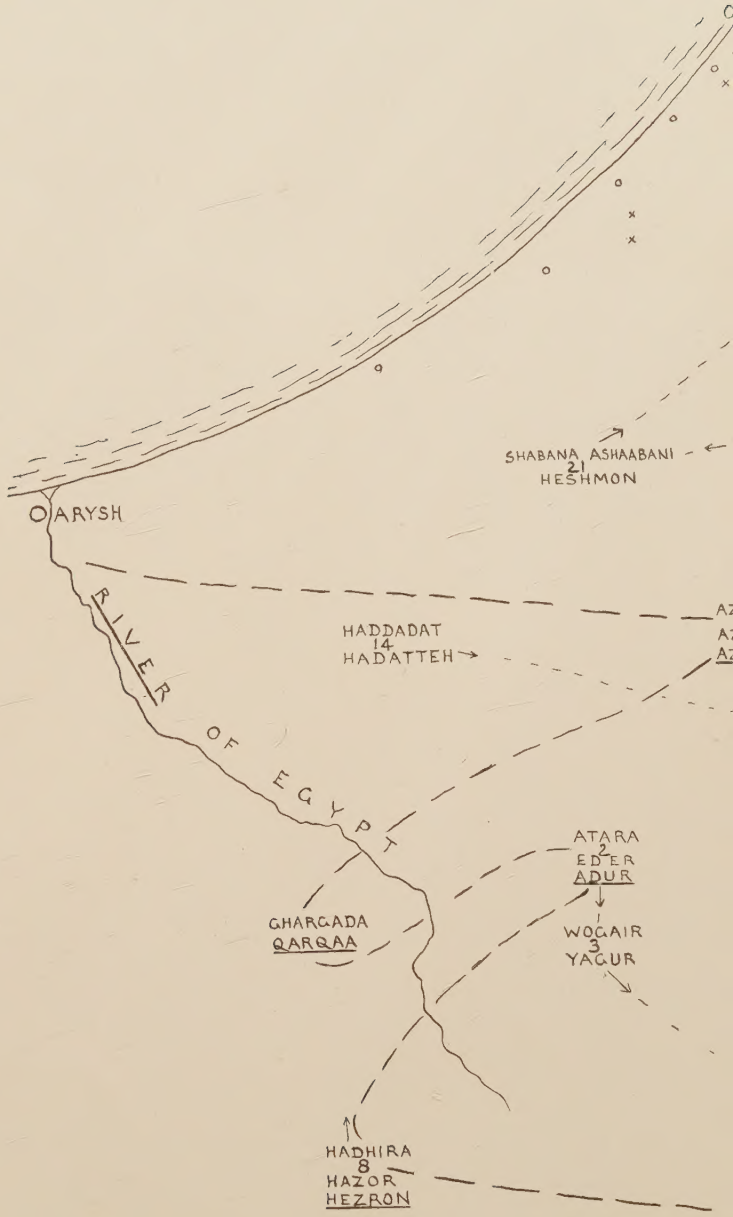
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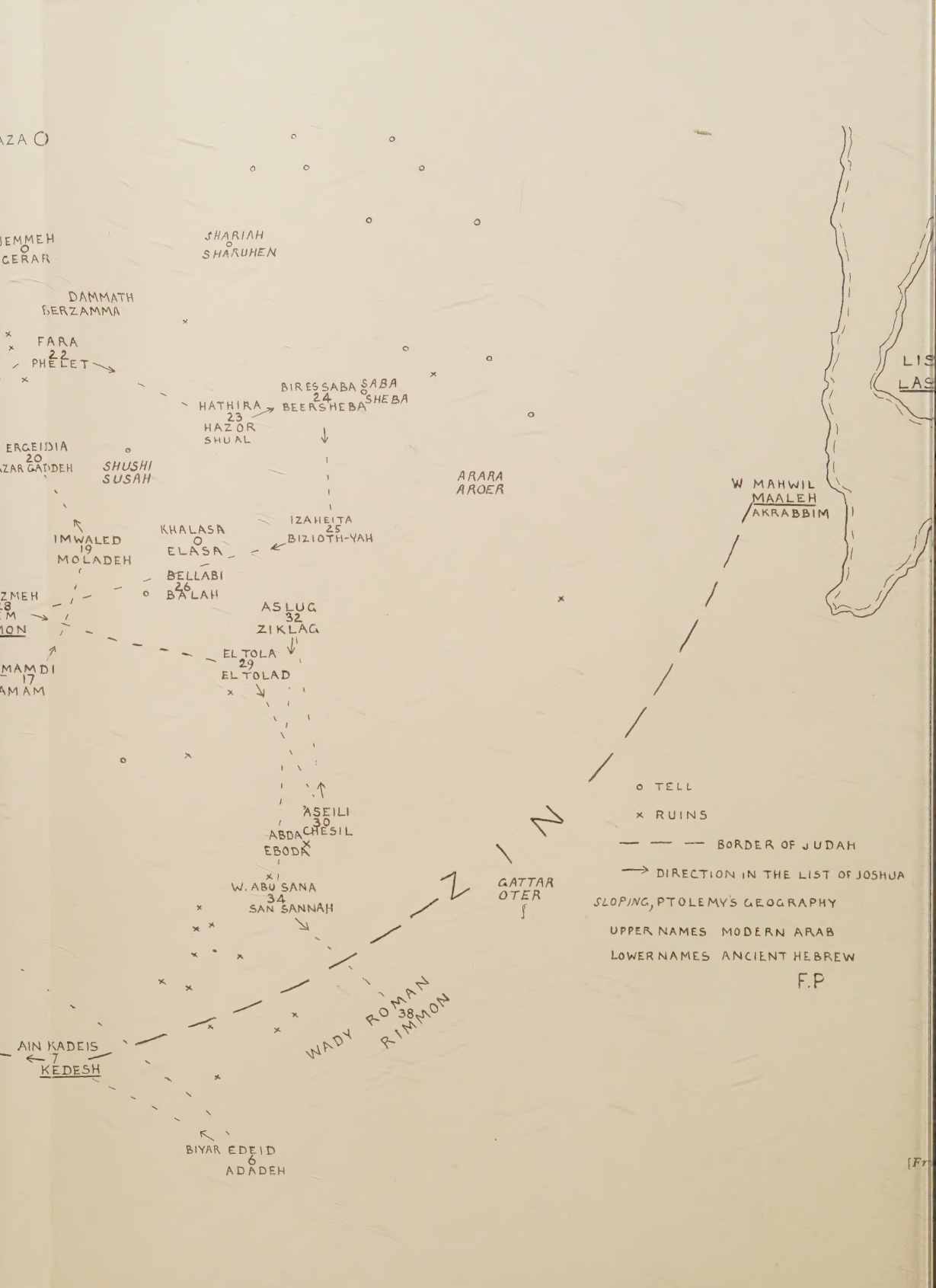
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ANCIENT EGYPT.

THE SOUTH OF JUDAH.

THE South country is often mentioned as something out of the ordinary range of Palestine. Anciently it was not so dry as it is now, but it was never so regularly settled as the land to the north, owing to movements of the people during drought. Here David sheltered as an outlaw, and it has always been a wild border. It was in recent centuries the resort of fluctuating Arab tribes, and was scarcely ever visited in modern times, until Mr. (now Colonel) Lawrence and Mr. Woolley made a detailed survey in 1911 to 1914. This survey, and the later tranquillising of the district by British management, has opened up a region full of ancient sites; while from its nearness to Egypt it provides such close links with Egyptian history that it gives an historic basis for Palestine archaeology and the relations with Egypt.

The names of the 38 towns of this region in the book of Joshua are detailed in the list on p. 99 and are entered, so far as they can be identified, in the frontispiece map. Hitherto only a few of these names have been assigned to modern places, without any system, and without reference to the meaning. The modern map gives many names that are obvious equivalents of the ancient names, without any assumptions of corruption which have been so freely proposed. The two principles for our guidance in such identifications are, first, that the places should follow in some connected order (due to an official list, or to memory); second, that the Arabic name should have the same meaning as the Hebrew, and be thus the direct continuation of it. Of course there are occasionally mere continuations of a sound corrupted.

The material of the lists is given in a tabular form here, from the early records; it is hardly worth while to include the late condensation in Chronicles which adds nothing further. The best geographical list is that of the "uttermost cities of Judah" in Joshua xv, 21–36. This is partly repeated in Neh. xi, 25–30, at the re-settlement after the captivity. Much of the list recurs as that of the cities transferred to Simeon (Joshua xix, 1–8). There is also the list of the south boundary of Judah (Joshua xv, 1–4); and that of the haunts of David in exile (1 Sam. xxx, 26–31). Only the district south of Beersheba need here be considered.

The forms of the names in the English translation are misleading, as regards some letters; for purposes of identification we need to express letters uniformly, and therefore the following values are used here in transliterating the Hebrew :— vau, *u*; teth, *th*; yod, *y*; kaph, *k*; samech, *ç*; ayn, *o* (often altered to *kh*

or *g*) ; tzaddi, *tz* ; koph, *q*. In the map, the Arabic names are placed above their equivalents ; in the lists they are in *italics*. The list of the 38 towns is here followed in order (Arabic in *italics*) :—

1. Qabtz-El, "the assembly of El," apparently a sanctuary named first from its importance : it marks the Arab influence of El, Allah, in contrast to the Hebrew worship of Yah. (On this antagonism, see nos. 25 and 29.) The position of this should be to the north of no. 2, Atara, but wide stretches of sand waste have covered that region and no names remain.
2. Oder, *Atara*, a name given to an open plain ; in most instances of surviving names the town has vanished, swept away or sand-buried, yet the name remains. This site is confirmed by being next to
3. Yagur, *Wogair*. After this, nos. 4 and 5 cannot be identified.
6. Ododeh, *Edeid*, probably the valuable position of the wells of Edeid, near the next point.
7. Qedesh, *Qudeis*. This site has been disputed, but on the map its position between nos. 6 and 8 leaves no doubt of the identification.
8. Hatzur, *Hadhira*. Though a common name for a town or settlement, this would always be one of the important sites as it catches the rainfall from a wide basin of the Gebel Helūl.
9. Ytnan was the end of a list, followed by another list of 29 towns so numbered in *v*. 32.

10 to 13, beginning the second list, cannot be identified, but the track is found at

14. Hadattah, *Haddadat*, towards Arysh. Nos. 15 and 16 are unknown.
17. Amam, *Mamdi*, lies to the east then, turning north,
19. Moladeh, *Imwaled el kheil* "the birthplace of the horse," perpetuates the Hebrew name, and gives the remainder of the name, showing the trivial origin of it. This is a curious case of survival.
20. Hatzurgaddeh seems to be the origin of *Ergeidia*, according to the relative positions.
21. Heshmon, "fatness," is evidently the *Ashaabani* district of the well *Shabana* or "fat."
22. Beth-palet, or phelet in Nehemiah, "the house of escape," is the modern *Tell Fara*, meaning "escape," which root otherwise takes *l* in *falata* "he escaped." This is the site of our excavations, last season, and continuing at present.
23. Hatzur Shuol, *Hathira*, is between nos. 22 and 24, Beersheba.
24. Beersheba has always been known without doubt. Its importance is due to being in the focus of a great drainage basin which ensures water supply.
25. Bizyuth-Yah, "the despising of Yah," or repudiation of Hebrew worship, was a name probably due to the neighbouring people of El-tulad, or "the family of El." This dominance of the worship of El accords with the name of the assembly of El heading the list. *Izaheita* is in the likely position and may be a corruption of the name.
26. Baaleh, or Bolah, seems to be *Bellabi*, by the position.
28. Ozena, or Azam, agrees with the district of *Azazma*.
29. El-tulad, *El-tola*, the "generations" or "family of El" (*see* no. 25).
30. Keçyl may be 'Aseili valley.
32. Tziglag (Ziklag) has been assigned to *Aslug*, and the position among other places confirms this, as against other suppositions.

Jos XV, 21-36	Neh XI, 25-30	Jos. XIX, 1-8	Jos XV 1-4	1 Sam, XXX 26-31
1 Qabtz-El	1 Yeqabtz-El			
2 Oder *Atara*	(2 Yeshua		7 Adar	
3 Yagur *Wogair*			(1 Salt Sea	
4 Qynah			(2 Lashun *Lisan*	
5 Dymunah			(3 Oqrabbym	
6 Ododeh *Edeid*			(4 Zin	
7 Qedesh *Qudeis*			5 Qadesh Barneo	
8 Hatzur *Hadhira*			6 Hezron	
9 Ytnan			(8 Qarqoa *Ghargada*	
10 Zyf				
11 Thelem				
12 Bealoth				
13 Hatzur				
14 Hadattah *Haddadat*				
15 Qeriut				
16 Hetzrun				
17 Amam *Mamdi*				
18 Shema				
19 Moladah, *Imwaled*	3 Moladah	3 Moladah		
20 Hatzur gaddeh, *Ergeidia*				
21 Heshmon, *Ashaabani*				
22 Beth palet, *Fara*	4 Beth-phelet			
23 Hatzur-shuol, *Hathira*	5 H-Shual	4 H-Shual		
24 Bir Sheba *B. es Saba*	6 Bir sheba	1 Bir Sheba		
25 Bizyoth-Yah, *Izaheita*		(2 Sheba, *Tell es Saba*		
26 Boleh *Bellabi*		5 Balah, Bilhah (Chr)		
27 Oyym				
28 Ozem *Azazma*		6 Azam	9 Azmon	
29 El-tulad *El-tola*		7 El tola	(10 river of Egypt)	
30 Kesyl *'Aseili*		(8 Bethul		2 Bethel
31 Hermah		9 Hermah		11 Hermah
32 Tziqlag *Aslug*	7 Tziqlag	10 Tziqlag		1 Tziqlag
33 Madmannah	(8 Mekoneh	(11 Beth markaboth		
34 Ganganah *Sana*		(12 Hatzar Susah *Shushi*		
35 Lebaoth		13 Beth Lebaoth		
36 Shilhym		(14 Sharuhen, *Sharieh*		
37 Oyn		15 Oyn		
38 Rimmon *W. Roman*	9 En Rimmon	16 Remmon		
	10 Zareah	17 Oter *Gattar*		
	11 Yarmuth	18 Oshan		12 Kur Oshan
	12 Zanoah	19 Baalath-bir		(5 Aroer *Arareh*
		20 Ramoth of South		3 S. Ramoth

34. Çançannah is probably in *Wady Abu Sana,* as that is on the way to the following—

38. Rimun, Rimmon, is the valley of pomegranates, *Wady Roman.*

In the other lists there are a few more places to be noted. In Joshua xix, after Beersheba, is

2. Sheba, *Tell es Saba,* to the east of the *Bir es Saba.*
11. Beth Markaboth, "of the chariots," and
12. Hazar Susah, "place of the horses," are connected; by the position between Ziklag and Sharieh, it is evident that this is *Esh Shushi.*
14. Sharuhen is generally identified with *Tell Sharieh.* It was probably the city Sharhana, which the Egyptians took during the expulsion of the Hyksos.
17. Oter must be in the South, as it is next to Remmun, and the *ayn* seems to pass into the modern *Gattar.*
20. Ramoth of the south appears again in David's list, but the name seems lost. David's Aroer, no. 5, has been placed at *Wady* and *Bir Arara,* toward the Dead Sea.

Regarding the geography of Ptolemy, the only way to study it is by trying to break it up into the original statements from which he worked. By plotting it out, and then searching for three or more places in a straight line, it is probable that a road line can be recovered. Then the distances along that line will give the distances actually used for the geography. Differences of 2′ or 3′ are negligible, as the latitude and longitude are only stated within 5′. On Ptolemy's map of this region, the professed north is really N.N.E. The name of Eboda is plainly *Abda,* now "a ruined *town*"; from this, therefore, Elasa would be the Arab *Khalasa,* an important town and junction of roads. Berzamma is evidently a well, Bir, and is in line with Beitagabra and Jerusalem; at this position is the district of *El Dammath* at the right distance for Zamma. Drusias, named after Drusus the brother of Tiberius, must have been a very important city under Herod, and the great Herodian building at Hebron shows that to have been the most important place in this region at that time. It is in the same position as Drusias, especially in relation to Engedda, *Ain Gedi.* Thamira, north of this, is obviously *Wady Ta'amira.* Esbus, between Gaza and Beitagabra, agrees in position with *Tell Idbis.*

It is surprising that, without any special search for ancient names in this South country, the names gathered in this first survey should supply half of those recorded here in the book of Joshua. The names of small districts, two or three miles wide, without any remaining ruin mentioned, give the most frequent identifications. Only a third of the names are found on wells or modern sites; the sand dunes, blown over the land, have obliterated the ancient places, and in this desolate region the name clings to the ground and, in many instances, is all that has survived.

FLINDERS PETRIE.

THE SHISHAK MIGRATION.

Our excavations at Gerar have produced repeated evidences of a movement from Central Asia to the West, at about 950 B.C. In the last year's work, further instances of such a movement have come to light, and the whole view may now be focussed together. The various tokens of this movement are as follows.

At Gerar there were found pottery models of square waggons, with a division from front to back, and with two types of pottery wheels belonging to them, one smooth and the other knobbed. These belonged to about 970 B.C. Such model waggons, and both of these types of wheels, are found at Anau in Turkestan, 250 miles east of the Caspian. Similar knobbed wheels occur in the Treasure of the Oxus, from 300 miles further east. They were also brought into Assyria on their way westward. The knobbed wheel is a form suited to avoid sinking in loose surface sand, and belongs therefore to desert dwellers ; the use of such waggons and wheels must have been familiar to the Scythian Hamaxobioi (waggon-dwelling) and Hamaxoikoi (waggon-homing).

Two types of bronze arrow-head appear in the west from Central Asia. One at Gerar, in 970 B.C., has a tang at the side of the socket, as found at Tomsk, Perm, and the Caspian. The other, at Gerar, by 900 B.C., is the triangular-bladed arrow-head of Minussinsk, Altai, Perm, Siberia and S.W. Caspian.

The broad-bladed form of iron dagger is between 980 and 920 B.C. at Gerar, a type belonging to Anau, the Caspian, and the Caucasus. A bronze lance-head, with a rhombic mark incised on it, is dated to 950 B.C. at Gerar, and this mark is a regular Assyrian emblem.

Lastly, all the pottery figures of oxen at Gerar, more than a dozen, centring at 950 B.C., are humped : this type is Central Asian, and not found west of Mesopotamia. The movement of the people who brought in all these products must have been within a few decades, as the toy waggons and humped oxen would be forgotten by a following generation.

This movement, dated to about 970 B.C., naturally links with Sheshenq (Shishak), the " man of Susa," entering Egypt at that time, for it would have been senseless for such migrants to reach the extreme south of Palestine unless on the way into Egypt. The name Shushinak is that of the national god of Elam worshipped at Susa, who was also a great deity among the Persians (see Sykes' *Persia*) ; the " man of Susa " was a localised name like " Our Lady of Walsingham " or of Loretto. Whether Sheshenq was an Elamite or a Persian with a theophoric name, or directly named from Susa as his home, is not evident.

The careless reading of the genealogy of Horpasen has led to supposing that Sheshenq was of Libyan descent. To read it thus requires the insertion of a descendive, " son of," which does not exist ; it also makes a " royal mother " appear as an ancestor two generations before that line took the rule under Sheshenq, and it assumes that the names of a man and wife both recurred together at four generations apart. There is no reason for Sheshenq being supposed to be Libyan, and his name labels his origin plainly.

Now a further aspect of the subject comes into view. Looking at the parallel migration of Turkomans in the XIth century A.D., the Turkish troops entered Egypt by A.D. 1062, and another branch took all Asia Minor during A.D. 1074 to 1084. In 970 B.C. the earlier movement similarly seems to have branched into Asia Minor and reached Lydia, whence, a century later, they took shipping and went on to Etruria. This was recognised in Roman times, as a deputation of the Sardians read an ancient decree to Tiberius, in which the Etruscans recognised their kinship. The Babylonian connection with the Etruscans has already been stated, by Randall MacIver and others, on the ground especially of the divination by the liver, or hepatoscopy, being on exactly the same model among both peoples.

Further evidence of this connection is now to hand. The horned head-dress of divination in Babylonia (fig. 1) appears on a winged sphinx, which is embossed on an Etruscan bronze stand from the Barberini tomb (fig. 2).

The usual stand for vases of offering in Etruscan tombs is of the form of a cone with two globes over it, supporting the vase (fig. 3). The same form appears in an offering scene at Dura in Mesopotamia, of Roman age (fig. 4). It also passed out eastward to India, where it is found in Tinnevelly (fig. 5). Another form with only one globe is found in the offering scene at Dura (fig. 6), and appears in the Barberini tomb in Etruria (fig. 7).

The form of offering vase in the Dura scene (fig. 8) is also Italian, as fig. 9 from Bari and fig. 10 from Cumae.

Lastly, the Etruscans had a sort of mystery play, which is represented two or three times in the tombs. In this, a bearded man wearing a peaked cap (fig. 11) attacks another man, apparently an Etruscan, with the aid of a dog ; the attacker is finally beaten off and flees away. The name of this enemy is Phersu, and, in view of the Mesopotamian connections above, this can hardly be other than a Persian. The cap appears on coins of Tiridates II, 248–210 B.C. (fig. 12), and the cap and beard appear on the figure of a magus or sacrificing priest at Dura (fig. 13). This performance of the fight seems to commemorate a defeat of the Persians in course of the migration from Central Asia into Mesopotamia. A parallel to this was the commemoration by the Romans of their defeat of the Etruscans, by annually selling a man dressed as a Sardian or an Etruscan, in the open market (Plutarch in *Roman Questions* and *Romulus*). There are, then, three or four fresh evidences of the Etruscan origin from Middle Asia, affirming the conclusion derived from the hepatoscopy. The close historic parallel with the mediaeval Turkish movement conquering Egypt, and Asia Minor, gives good reason to accept some such migration as having been the basis of the conquests by Sheshenq and the Etruscans a couple of thousand years earlier.

The view of the whole period takes shape somewhat as follows. By about 1000 B.C., the East was upset owing to the advance of Assyria smashing Babylon, and a body of men from Turkestan began moving on Babylonia. They were obstructed by the Persians whom they defeated. The migrants then passed on westward and, within a generation, reached Egypt and Asia Minor. The rapid movement of the migrants shows that they were not a tribal party with property, but a fighting body of men headed by condottieri, such as the Persian or Elamite Sheshenq. Thrusting westward, these troops, as banditti or as mercenaries, passed on, some into Asia Minor and others down Syria. Skirting round the fighting kingdom of Judah, they found a free passage through Edom, which

Evidence of Asiatic Migrations into Europe.

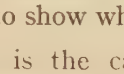
Etruscan and Italian connections with Mesopotamia, Persia, and India.[1]

had been overrun by David while their king was in exile in Egypt. The leader Sheshenq entered the Egyptian service with his men, settled at Bubastis, and in due course King Pasebkhanu gave his sister to the exiled king of Edom and his daughters to Sheshenq and to Solomon. For the family relationships, see *Egypt and Israel*, p. 68. During the rule of the XXIst dynasty at Tanis, on the far east of the Delta, the Libyans had pushed into Egypt on the west, and the XXIInd dynasty had to bring them to obedience by setting princes of the family to rule them, but with no more of Libyan descent than there is of Welsh descent in our Prince of Wales. Those of the eastern migrants who went into Asia Minor pushed along to the Aegean, as the Turks did later; within a century, finding that their devastation had impoverished the land, they shipped over into Etruria, where they formed a ruling class. A parallel to this may be seen in the Norse subduing Normandy, and, after absorbing the civilisation there, passing on into England as a conquering aristocracy. It may be asked whether there is any trace of these fighters, in the history of David. As they must have been at Bethpeleth as well as at Gerar, it is probable that they may be the bodyguard of Pelethites employed by David (for the difference of final *tau* or *teth* is not material). This guard was certainly of the south, coupled with the southern Cherethites near Ziklag (1 Sam. xxx, 14); they were ruled by Benaiah of Kabzeel in the south. They disappear after Sheshenq entered Egypt. If this identification be accepted, then David really dominated Israel by a bodyguard of Cretan and Turkoman mercenaries.

Flinders Petrie.

A STATUE OF KHEPER-KA-RA.

THERE is in the British Museum the upper part of a standing statue of black granite. Only the torso remains, the arms are broken off and the face is greatly damaged. The height of the fragment is 2 ft. 6½ in. It was presented by Colonel Howard Vyse in 1839 ; it is stated to have come from Memphis, though there is nothing to show where it was actually found.

On the belt is the cartouche  , inscribed in reverse order, so that it reads Ka-kheper-Ra. I am not aware of any other example of a cartouche in which the sign of the sun is placed at the end of the throne-name instead of at the beginning. As the date at which the statue came into the possession of the Museum precludes any idea of a forgery, the unusual writing must be accepted as showing the order in which the signs are to be read.

The statue is now placed in that part of the Sculpture Gallery which belongs to the late period, the name being taken to be that of Nekht-nebf (Nectanebo I), whose throne name was Kheper-ka-Ra. Prof. Petrie, however, considers that the statue has been wrongly dated, and that it really represents the Kheper-ka-Ra of the XIIth dynasty, *i.e.* Senusert I (*Student's History of Egypt*, III, 386).

To prove the case, it is necessary to compare not only the known portraits of Senusert I for the likeness, but also statues of both the XIIth and the XXXth dynasties for the style. For this comparison I take the statue of Kheper-ka-Ra, Nekht-nebf, in the Bibliothèque Nationale at Paris. I will call the British Museum statue (fig. 4) Senusert, and the Paris statue (fig. 5) Nekht-nebf, in order to distinguish the two.

Though the Paris statue is headless and armless, the torso is undamaged and can therefore be compared very well with the Senusert figure. Even at the first glance the difference in style is at once apparent. In the Senusert statue the intention is architectural, with broad surfaces ; in the late figure the artist has concentrated on rounded forms, smoothing away all harshness till the curves are almost feminine in their softness, and the details of the anatomy are lost. The difference of polish on the stone in the two figures is also marked. The mirror-like vitreous polish of the Paris statue is characteristic of the late period from the XXVIth dynasty onwards (*cp.* von Bissing, *Denkmäler*, pls. 69 and 73b), whereas the polish on the Senusert statue is not only less brilliant but differs in quality.

The details of the dress, as far as they remain, again show a difference according to period. The loin-cloth of Senusert, as far as it can be seen, is pleated in straight folds ; and in other Middle Kingdom and early New Kingdom standing statues the folds are usually represented in the same way, the lines hardly curving at all at the top till the middle of the body is reached. In the Nekht-nebf figure, the pleats begin to curve from the middle of the left thigh ; and this is also the case in another Nekht-nebf statue in the British Museum.

Details of the form and pleats of the *nemes* head-dress, in the Old, Middle and New Kingdoms have been worked out by Engelbach in the *Annales du Service*, XXVIII, pl. III. On reference to his classification it will be seen that the *nemes* of the Senusert figure (fig. 3), with its bands of unequal width, approximates to the Middle Kingdom type, while the even bands of Nekht-nebf are certainly late. The even bands of the *nemes* continue from the New

Kingdom down to the Ptolemaic period, as the statue of Ptolemy Philadelphus shows (Bissing, no. 104). The pigtail of the *nemes* is not shown in either the Senusert or the Nekht-nebf figures, on account of the height of the support at the back.

Though it is usual in Middle Kingdom statues not to continue the support beyond the shoulders, instances are not unknown (Petrie, *Tanis* I, pl. xiii, 1, 2, p. 5). The leather flap which holds the head-dress in place is carefully rendered, very different from the careless representation in the XXXth-dynasty head from Abydos (Petrie, *Abydos* III, pl. xxviii, 4).

The uraeus on the Senusert statue (fig. 2) is curved in folds like A6 of Engelbach's series, though the folds are closer together than in Engelbach's example. A6 is definitely dated to Senusert I, which is one more proof of the early date of the statue under consideration. The tail of the uraeus is continued till it touches the back support.

We come now to the portraiture. In the Senusert statue, the square face with high cheek-bones and a general expression of force and virility is quite at variance with the softly rounded forms and gentle delicacy of the portraiture of the XXXth dynasty (Petrie, *Abydos* I, pl. lxx, 12, and III, pl. xxviii, 4). The Paris statue has no head, nor has the similar statue of Nekht-nebf in the British Museum ; and there is, as far as I know, no portrait of that king in the round. There is, however, in the British Museum a portrait in hollow relief of Nekht-nebf (*History*, III, fig. 160) ; this shows a man with a nut-cracker profile, the mouth falling in between the prominent nose and chin. Nothing more unlike the Senusert statue can be imagined. When the Senusert head is compared with the Koptos portrait, also in hollow relief (Petrie, *Koptos*, pl. ix), the likeness is at once apparent. In comparing the statue with the statues of that king found at Lisht (fig. 1), allowance must be made for the inveterate habit of almost all

FIG. 4.—SENUSERT I. XIITH DYN. BRIT. MUS

FIG. 5.—NECTANEBO I. XXXTH DYN. PARIS.

Egyptological photographers of taking a portrait from so far below that the spectator is looking up the nostrils; this defect is due to skying in museums. The upper part of the face is thus liable to be foreshortened and the features, as in this instance, are distorted. In spite of this, the likeness between the two figures is very marked; there is the same square face, the high cheek-bones, the rather narrow eyes set at a downward angle towards the nose, the fullness of the under eyelid, and the same square determined chin, though bearded in one and unbearded in the other. The mouth is greatly damaged in the British Museum Senusert, but the smiling effect is the same as in the Lisht portrait. The level brows in our statue are emphasized by a technique known in the Tanis head of Amenemhat I (Petrie, *Tanis* I, pl. xiii, 1). The brows of the Lisht statue, especially the left one, suggest a horizontal line, as can be seen by noting that the height of the forehead between the brows and the head-band continues equal throughout its length. It is, however, in delicate nuances of this kind that the distortion of the wrong point of view in photographing becomes lamentable. The naso-labial folds on the cheeks are rendered in the same way in both statues. The ears in both figures are of natural size; the exaggeratedly large ears found in sculptures at the end of the dynasty do not appear to occur till Senusert III. Though the nose in the British Museum statue has been broken away, enough of it remains for comparison, had a scientific photograph of the Lisht figure been available.

The difference in the anatomical rendering between the Senusert and the Nekht-nebf figures is another point to be remarked. In the Senusert, the artist realised the underlying structure of the human body. The sternal ends of the clavicles are indicated, as also the hollow at the lower end of the neck between the clavicular ends of the sterno-mastoid muscles; the acromion process on the shoulder is faintly marked, as in life; the lower border of the ribs is visible on each side of the body; the projection of the scapula disappears behind the back support, but the line and modelling of the trapezius muscle can be seen; the upper edge of the navel shows the slight overhang which is sometimes found in certain persons. On the fragment which remains of the upper arm, the deltoid and biceps muscles are well indicated. Compare these details with the Nekht-nebf figure, where the clavicles are represented by a ring round the neck, the muscles of the chest and abdomen are merely rounded masses without any real form. In another Nekht-nebf figure now in the British Museum the same characteristics are visible; part of the arms remain, and these show no feeling of the sculptor for anatomical structure, they are merely cylindrical. The navel is merely a round hole. (*Cp.* also the anatomical modelling on the statue of Amenemhat III, Cairo Museum.)

The only inscription on the Senusert figure is the cartouche on the belt, for the back support is uninscribed. The hieroglyphs show a marked distinction from the similar cartouches on the belt of the Nekht-nebf figure, even apart from the unusual arrangement of the signs. The Senusert cartouche is somewhat square in outline, approximating more closely to the shape of the cartouches on the Deir el Bahri statues of Senusert III. The horizontal line of the sign is the same width as the vertical lines, as is also the of Senusert III, whereas the of Nekht-nebf has a thick base with rounded top, which is a rough attempt to represent the upper arm as seen in the careful hieroglyphs down the support at the back of the statue. In the Senusert cartouche the beetle has a three-lobed head and a body with straight sides,

giving a square effect ; the front legs rise from the upper " corners " of the body in an upward curve ; the middle legs begin immediately under the upper pair and turn downwards with a slight curve ; the last pair start from the lower " corners " of the body curving downwards at once, turning inwards again with so slight an angle as to be almost a curve. In the Nekht-nebf cartouche the body of the beetle is too roughly made for any distinct shape to be seen ; the head is two-lobed ; the upper legs turn downwards when leaving the body, then curve up at an acute angle ; there are no middle legs ; the lower pair start almost horizontally from the body before turning downwards at a sharp angle. The ⊙ sign in the Senusert cartouche is not dotted ; in this it is like the same sign in the Nekht-nebf cartouche ; but the presence or absence of the dot is no evidence of period, for the ⊙ sign occurs with and without the central dot on the statues of Senusert at Lisht.

On all counts, therefore—style, method of working, physiognomy, and anatomy, as well as details of *nemes*, uraeus, loin-cloth, and hieroglyphs—we claim that the British Museum statue represents Senusert I and not Nekht-nebf.

My hearty thanks are due to Dr. H. R. Hall for the facilities given me to examine the statue in great detail and also to have it photographed.

M. A. Murray.

HAND SPINNING IN MODERN EGYPT.

Flax Spinning.

It is a rare thing nowadays to find flax spinning on a hand spindle in Egypt, though wool spinning is often enough seen. Flax is considerably grown, but much is exported and the remainder largely used for making twine or rope, a purpose for which the thread is sometimes spun on a primitive type of hand-spinning machine. But hand-spindle spinning is still also occasionally used with flax thread for making nets and for other purposes, as described by Klunzinger long ago at Kosseir.[1] More rarely, women may still be found spinning fine thread for the weaving of a piece of linen on one of the village looms. Such spinning can be seen at Nahia, just north of Kirdasseh, near Giza. Nahia is a picturesque village of beautiful old houses, with jutting balconies and fine inner courtyards. Rich fields lie round it, but the desert edge is not far away. I shall not easily forget my first sight of the green waves of flax, bright in front of the dark stems of tall palms and, behind the palms, yellow sand and the Pyramids of Giza sharp against the sky. It was a sight most beautiful in itself, and it also held promise of interest in the industry to be seen in the village, and the possibility, always in the mind as one watches village life in Egypt, of light to be thrown on the past from the primitive present. The earlier processes of preparing the flax could not be seen at the time of my visit but they were described to me as follows. When gathered, the flax is laid to soak in water, to soften and disunite the fibres, the "retting," which takes about fifteen days, according to the temperature. Then it is raked, laid to dry, turned, and then dried again—this is equivalent to "grassing." When dry it will keep for two years, and is said to be better after keeping for a year or so than when freshly gathered.

My informant did not mention the ripple, an iron comb used for removing bolls from the freshly gathered flax; he may have forgotten it.

The further processes of preparation were going on in a large inner court-yard, and the friendly people told and showed me all they could in the time. When required for spinning, flax must be "scutched," and the first part of scutching is the breaking or bruising of the flax. At Nahia this is done by beating it with a wooden mallet on a large stone (fig. 1); several stones were arranged against the side walls of the court for this purpose. After the breaking comes the scutching proper, the removal of the tow by scutching blades. This is shown in fig. 2; the worker simply beats the broken flax with a large wooden fan or bat, to shake out all the loose pieces. These two processes are always carried out by men, but the next, "hackling," is the work of women, and two of them are seen at it in fig. 3. The flax is drawn through a comb, the metal teeth of which are set upright in a metal plate on a wooden block. Now the flax is ready to spin.

This is here, as in other places in Egypt, usually done on a "dulab," a kind of spinning machine shown in fig. 4. This photograph was taken at the Agricultural Exhibition at Giza, and the "dulab" came from Zifta, but a precisely similar machine and process were seen at Nahia. The man spinning

[1] *Upper Egypt.* C. B. Klunzinger, p. 305. Fisherman making thread with spindle.

1.—Scutching Flax: First Process, Breaking with Wooden Mallet on a Stone. Nahia.
2.—Scutching Flax: Second Process, Beating it with Wooden Fan on Stone. Nahia.
3.—Hackling Flax on a Comb with long Metal Teeth.
4.—Dulab, or Spinning Machine, from Zifta.

has the flax round his waist, and he walks away backwards usually spinning one thread at a time, using both hands to draw and even out the thread while a boy turns the wheel. By a reverse movement, winding is effected on to a bobbin on the " dulab " while the man walks forwards to it. In the photograph the man is seen spinning two threads at once, one with each hand, which he did in response to my telling the little group of lookers-on of the ancient Egyptian spinners who were so skilful that they could spin two threads at once. His feat was evidently highly regarded, but it was not equal to that of the damsels of former days, nor indeed could that be emulated by the hand-spinners of Nahia. The women there can produce a fair thread, but though dexterous they were not very swift, and I did not feel the admiration and surprise so often excited by the skill of the cotton-spinners of the Sudan. Yet their spinning has interesting features, and is even regarded as something of a wonder by the people round. When I discussed it beforehand, my informant laughed, and said, " I suppose you want to see the women who spin through the mouth ! " And, indeed, the women of Nahia do spin through their mouths—they let the growing thread run between the lips so as to keep the fibres even and moist. The flax is held in the left hand, close to the mouth (figs. 5, 6), and the spindle is twirled, whorl downwards, by the thumb and first and second fingers of the right hand. The spindle is allowed to drop and spin but is usually controlled in the hollow of the hand, and the spin is very short. I did not see any rolling of the spindle on the thigh, but the women were spinning yarn to be woven into linen for themselves on the looms of Kirdasseh, and that shown me was soft-spun and suitable for weft. It may be that they would put a harder twist on for warp thread and roll on the thigh for this purpose, but into this, unfortunately, I did not enquire.

So far, our study of the present at Nahia. Now, how far back can we trace any of the tools and methods in this flax industry ?

Tools.—The breaking of flax by beating it with a mallet over a stone is a common early way of doing it ; it is represented at Beni Hasan, is mentioned by Pliny (XIX, 3), and it was formerly practised in Ireland, among other countries. The interest here lies in the wooden mallet, *el durs* (fig. 10), an implement described by Sir Flinders Petrie as " a primitive form which has not yet been superseded " (Petrie, *Tools and Weapons*, p. 40). That used at Nahia had a heavy longish head with a cylindrical handle, cut in one block of wood, and it was extremely like some of the mallets figured in *Tools and Weapons*, especially figs. 61, 64, on pl. XLVI. Of course, such mallets were, and are, used for may different purposes. In this flax-beating they get worn to a waist (fig. 11) ; a similar wearing is seen figured in *Tools and Weapons*, pl. XLVI, figs. 64, 65. There is a mallet which is also similarly worn, in the British Museum, one presented by Somers Clarke, no. 30754, case C, Fifth Egyptian Room.

The stones lying on the floor along the walls of the court, used for the beating of the flax, were very suggestive of the blocks along the walls of the XIIth-dynasty weaving model discovered by Winlock (*Ancient Egypt*, 1921, pt. IV), but there is no direct evidence as to what the women sitting behind the blocks were doing. They may have been beating flax on the blocks or have been engaged in some later process, some preparation of a rove by hand, as suggested by Ling Roth. The women of Nahia made no further preparation of the flax after combing it, so I received no light on this subject from them.

5, 6.—Flax Spinning through the Mouth, Nahia. 7.—Flax Spindle, Nahia.
8.—Wool Spindle, Darau, Upper Egypt. 9.—Boy Spinning Wool, Nahia.

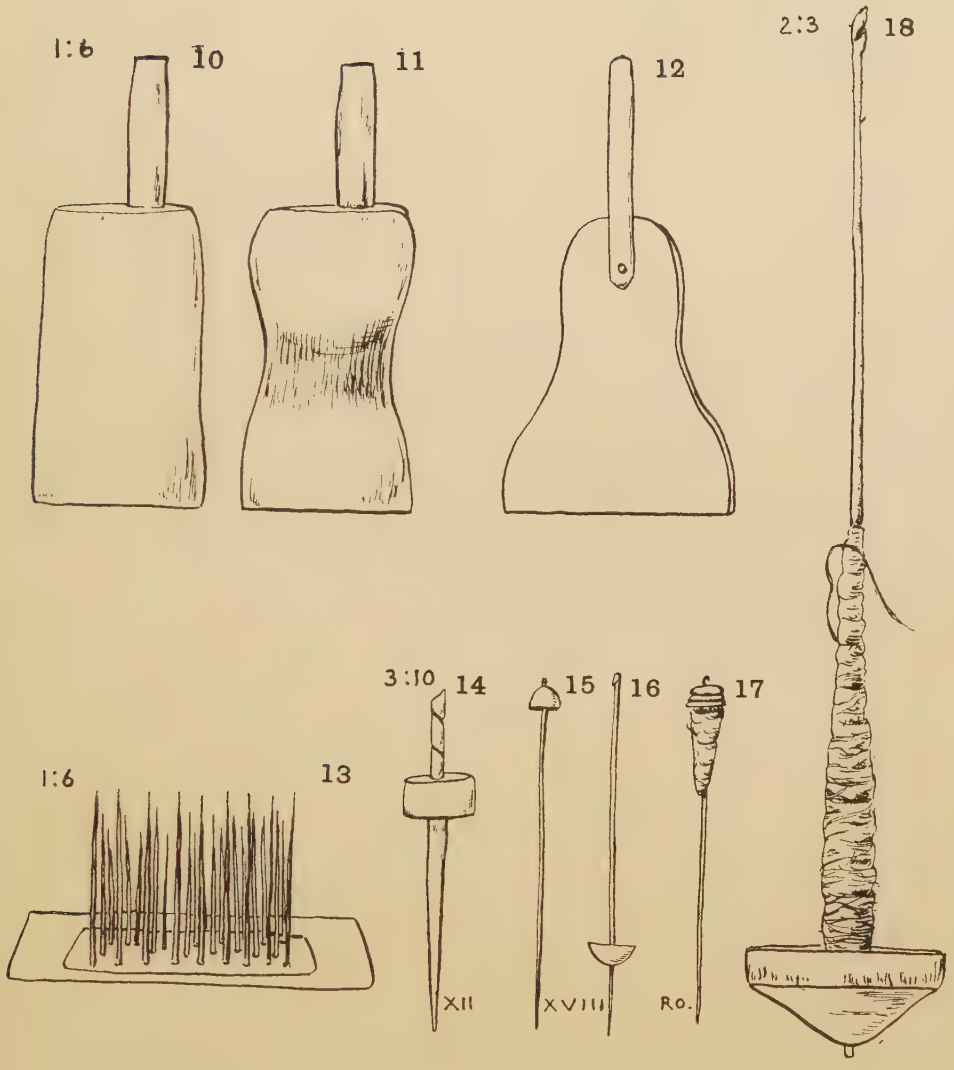
One thing is certain, that the spinners of Beni Hasan, and of the model, spin from a long prepared rove, and this must have facilitated the spinning and doubling shown on two spindles. The only reference I have found to any practice remotely resembling this is an illustration in Klunzinger's *Upper Egypt* (p. 305) of a fisherman doubling thread by the help of two spindles and a skein round his knees. I still hope some day to come upon a similar practice in some lost corner of the world.

The fan or scutching blade, *el minfada* (fig. 12), is not so easy to parallel as the mallet; there is one implement from Egypt similar to it in a wall case at the British Museum, no. 5409, cut out of one piece of wood, however, while in our blade the handle is a separate piece fastened on, obviously a late feature.

The comb or hatchel, *el misht* (fig. 13), with iron teeth used for hackling, also does not appear very primitive. Pliny mentions the combing of flax with iron teeth (XIX, 3), but the only combs I have seen at all like this particular type are some heavy English ones in the Bankfield Museum, Halifax.

The flax-spindles seen at Nahia had a wooden or metal stem with a notch at the top and a wooden whorl at the bottom, the specimen figured (figs. 7, 18) is one with a metal stem. This is a type quite unlike most of the ancient Egyptian spindles yet discovered; the only one which it resembles is a unique spindle of the XVIIIth dynasty from Gurob (fig. 16) (see *Gurob*, Brunton and Engelbach, pl. 13, fig. 8). The Gurob spindle, which was found with the whorl in position on the stick, has a distinct notch on the top and a wooden whorl at the bottom; there is no doubt whatever that such a spindle must have been spun whorl downwards, like the spindles of Nahia. But this spindle is a solitary instance of such a position of the whorl; all other ancient Egyptian spindles yet discovered, so far as I know, which show a notch, or a groove, or a hook for the thread, must, from the position of these and the whorls, have been spun whorl uppermost. The main types of spindles of the XIIth and XVIIIth dynasties and of the Roman period are shown in drawing (figs. 14, 15, 17) to illustrate this. (See *Tools and Weapons*, Flinders Petrie, p. 53, pl. 65, figs. 138–43.) The typical XIIth-dynasty spindle (fig. 14) had a cylindrical whorl and a shaft with a deep spiral groove round it; the spindles of the Winlock model are of this kind, and they were spun whorl uppermost. Coned wooden whorls and domed limestone whorls were also used in this period. The typical XVIIIth-dynasty spindle (fig. 15) had a small domed whorl, and the thin stem had a cut across it near the top for a thread notch; it was spun whorl upwards. The spindle of the Roman period (fig. 17) is known with various types of whorl, its characteristic is the iron hook above the whorl to catch the thread on; it was spun whorl uppermost. The wool spindles used by the fellahin to-day are of this type.

Method.—The method of spinning at Nahia is that called Suspended Spindle, where the spindle, after being twirled, hangs freely in the air. It was the method of ancient Egypt, of Greece too, and of Rome—indeed, it was for centuries the method *par excellence* of the whole of the old world. But there were, and still are, very interesting local variations in the method, and these repay study. The chief peculiarity noted among the Nahia spinners was their "spinning through the mouth." There are references to such a practice in the classics, to even or to moisten the thread (Senec. Herc. Oet. 373, quoted by Daremberg et Saglio), and it is shown very clearly by the figure of a spinner



10, 11.—Mallets. 12.—Scutching Fan. 13.—Hackling Comb.
14–17.—Ancient Spindles. 18.—Modern Flax Spindle.

on a vase from Orvieto (Dictionnaire des Antiquités Grecques et Romaines. Daremberg et Saglio, fig. 3382, p. 1426). Catullus ascribes it to those august spinners, the Fates themselves: "Their hands duly plied the eternal task. The left hand held the distaff clothed with soft wool; the right hand lightly drawing out the threads with upturned fingers shaped them, then with downward thumb turned the spindle poised with rounded whorl; and so with their teeth they still plucked the threads and made the work even. Bitten ends of wool clung to their dry lips which had before stood out from the smooth yarn" (Catullus. *The Fates.* Transl. by Cornish. Quoted in *Craftsmen All.* Dryad Handicrafts). I know of nothing illustrative of any similar practice in ancient Egypt.

The special features which strike a student of the representations of spinners at Beni Hasan and El Bersheh are: (1) there is no distaff; (2) the spindles are spun whorl uppermost; (3) the spindle is rotated by rolling it on the thigh. These features seem unusual, because in the spinning with which we are more familiar, the classical, or the European type, the distaff plays an important part, the spindle is spun whorl downwards, and it is rotated by twirling it between the finger and the thumb. Schliemann, for instance, was so possessed by the idea that the Beni Hasan spinners must have had a distaff that he suggested that it might have been hidden in the vase or basket at their feet (*Troja,* Schliemann, p. 296). The distaff is not unknown in Egypt, it appears to have been introduced in Roman days, and there are rare examples like those in the museums of Leyden and Brussels made of split cane in a similar way to those figured by Gardner Wilkinson from Thebes (Manners and Customs Anc. Egyptians. Vol. 3, p. 136, fig. 355, 1, 4). I have heard of the use of a split cane or reed distaff in modern Egypt, but I have never seen it; in the Sudan I only once saw one used by a Berti man near Shirkela, in Kordofan.

In fact, the modern hand spinners of Egypt, whether of flax or of wool, all prefer to spin without a distaff, and so do the cotton spinners of the Sudan. In this particular, then, of spinning without a distaff, the flax spinners of Nahia follow the ancient way of the country; their mallet too, as already noted, is a primitive tool, but they spin with their spindle whorl downwards, and rotate it by twirling it between the finger and thumb, and here they follow European rather than Egyptian methods, and their habit of passing the thread through their mouth, while spinning, links them with Rome.

Wool Spinning.

Now, if we turn from this example of flax spinning to the wool spinning of the fellahin, very different inferences will be drawn. The very attitude of the boy spinning wool at Nahia (fig. 9) is characteristic; his uplifted hand shows how the raw material is held while the spindle is dropped and rotates whorl uppermost. Both men and women spin in this fashion all through the country; they do naturally give a twirl to the spindle with the fingers now and then, but one never has to watch them long before seeing them roll it on the thigh, whether they are sitting or standing.

The spindles that they use to-day are like the type of the Roman period. One from Darau, in Upper Egypt, is represented in fig. 8. The spinner to whom it belonged, whom I met in Omdurman, used to prepare her wool with the greatest care, washing it in river water, spreading it to dry on clean sand, and teasing it

out by hand. Her spinning was beautiful to watch, the yarn fine and extremely even, and she used to delight me by making it up into enormous balls, about 9 inches in diameter, very much resembling the great ball of flax yarn in the Ashmolean Museum at Oxford.

Wool spindles are usually larger and heavier than the one figured, and have a variety of whorls, sometimes round and sometimes square; occasionally a wooden hook or notch is cut at the top of the stick above the whorl, but the metal hook fixed into the top of the whorl is much more common. The stems of these spindles never have the true spindle shape; instead of tapering at both ends and bulging in the middle, they are merely slender sticks tapering at one end, and of such a length that they give ample room for the palm of the hand to rest on them while rolling them on the thigh.

If we now set what we know of this wool spinning against such knowledge of the ancient Egyptian craft as has come down to us from the monuments, models of weaving-rooms, and the actual spindles, we find the same method of spinning; the spinner holds the raw material in the left hand, rotates the spindle by rolling it on the thigh with the right hand, and then allows it to drop freely swinging in the air, whorl uppermost; also the hieroglyph for spindle, *khes*, , showing the shape, position of whorl, and cone of yarn under the whorl, confirms this.

These remarks also hold good for the beautiful and interesting cotton-spinning of the Sudan, which cannot be described here.

Both these crafts, on the evidence available, appear to descend directly from that of ancient Egypt.

GRACE M. CROWFOOT.

EXCAVATIONS AT BETH-PELET.

AGAIN we have four hundred Bedawyn of the desert, and their children, actively at work for the British School of Archaeology in Egypt, but it is Egypt over the border, as they are digging " the uttermost cities of Judah " in South Palestine, under the direction of six excavators, to extract the history which lies there. That history has been the most intensive subject of belief and of disbelief, debated with ill-informed ardour on both sides. Yet the energy has all been spent in words and not in deeds. Even now it seems that but few people care to have the material facts opened out before them, and to know what were the actual conditions of those times which have been familiar to them by name alone. The mounds of the cities are waiting to be dug out, the history is lying there awaiting interpretation, enthusiastic students long to work all day at disclosing it, yet few of the public seem willing to supply the few thousand pounds needful to throw light on the narrative of the Old Testament. A farthing in the pound on the bill for luxury and amusement would do all that is wanted.

Here at Beth-pelet we are settled in the wilderness, 18 miles from the houses and shops of the hand-to-mouth levantine life of Gaza. The nearest drinkable water is fetched 11 miles by camel on alternate days from Khan Yunis, where there is also post and rail; on the other side lies Beersheba, 18 miles away. How to do anything under such conditions, in a place without any population or supplies, is the first question. The mobility of the Bedawy is our strength. So soon as pay is to be had here, the workers flock in, many of them already trained and competent from our previous excavations at Gerar. They bring their families to work with them, and settle down in their half-dozen rows of black goats'-hair tents. For our food, a man goes to Gaza one day and returns the next, bringing supplies twice a week. Milk is scarce to get, as there is barely any food for the cattle, but by enlisting seven milk-boys on the terms " no milk, no work," we squeeze enough driblets from the countryside.

The people here live in hope of rain. We had two days of storms which gave two or three inches' rainfall, and six inches at Jerusalem. This sufficed to encourage life again. Every little dried root began to show tiny leaves, and the moles started their affairs, throwing up long lines of mole-hills, 37 in one row along the side of a hill, about 4 feet apart. What they live on is hard to guess, and still harder to imagine how they live through months of drought. The Bedawyn have been ploughing a large part of the sandy hills, in the faith that they may raise a crop. Some have ventured on sowing, and a faint green haze shows up, only to wither hopelessly if rain does not come in two or three weeks. The ploughing is all done with a camel, scratching a little groove about 3 inches deep in the sandy waste, such that birds can eat up the broadcast grain.

How a people can thrive under such conditions we also can scarcely imagine; even in good times, the girls search the desert for the little bulbs and roots of the wild plants to eat, and in time of famine they hunt for food in filth like a London sparrow. A regular flow of wages, more than £100 a week poured into the district, is an immense benefit to both the physique and training of the workers. It looks strange to see a wild fellow with shaggy hair, and a dagger in his belt,

doing most patient and delicate work in clearing out a grave, a quarter of an inch at a stroke, fingering all the earth to ensure that not a bead escapes. They train up to be quite as serviceable as the Egyptians. Nor must they be thought inferior to our home population. The girls who carry baskets of earth, all day long, wear dresses of their own embroidering; the women weave complicated patterns for their great stomacher belts, and they are as precise and neat as their condition of life will allow. Such are the folk among whom one lives for months in open huts without lock or door. Bright and active, cheery and smiling, they trust to pull through as their forbears have done, with only a leaky hair tent to keep off the rain and cold, and burnt up in a six months' drought every summer. Without any of the lazy man's protections of sheltered trades and old-age pensions, they press to get eighteenpence a day for ten hours' labour. Latterly, they are at least relieved from Turkish exactions, and benefit by our honest control of the native police who keep back the desert raiders.

Work began this season on the north end of the huge mound, as that was the part nearest to the water supply and pasture, and had the best wind. These conditions indicated its importance and, sure enough, we unearthed the foundations of the Roman fort, 62 × 52 ft., and four or five feet thick. They were dug down far into the ruins of older buildings, and piled with large flints from the stream-bed. Of the actual walls, there were only a few squared blocks of the first course remaining, and the building had all been carried off for stone elsewhere. After all this was planned and photographed, it was removed. Then appeared confused fragments of the Greek fort, cut to pieces by the Roman foundations. Descending 15 feet, we uncovered the walls and floors of Shishak's fort, which remained up to five feet high, built of sound yellow clay bricks. Beneath the floor of one of the rooms was a kind of foundation deposit, of three bone figures. The largest is a Syrian god with conical head-dress; being without emblems, it is not certain that it represents Sutekh. The small figures are of the usual Hat-hor type. The left-hand one has what seems to be the ends of a girdle tie hanging down below the breast, which may be the girdle tie of Isis (*see* fig. below).

Bone Figures of Syrian God and Hat-hor Goddesses.

Of the age of the fort there can be no doubt, as after it was all ruined, and filled up with decayed brickwork of the upper parts, a corn bin was cut down through it seven feet deep, and this was later used as a rubbish pit, filled up with Greek pottery of 600 to 500 B.C. This would put back the date to before 800 B.C., and pottery of that age, or earlier, was found in the rooms. As the bricks and building are like those of Shishak at Gerar, at 930 B.C., the date seems assured. The rest of the ground at that level is being cleared as I write, and soon we hope to finish the record of that age and then to reach the fort of David and Solomon below it, the headquarters of the Pelethite bodyguard.

Adjoining the fort on the west is a building of uncertain age, a hall with two columns in it. It had been partly removed for stone to place in Roman foundations, and in the floor lay hidden three lots of Judaean coins of the age of Nero. They serve to date the latest use of the place. Before that, it had been looted for material, and in it were stones from some earlier building coated with fine stucco. We can hardly unravel all these changes now, as our main purpose is to clear the site of the fort down to the earliest level.

HALL WITH COLUMNS, ADJOINING FORT, AT BETH-PELET.

The hill, as described last year, is precipitous to the stream-bed on the east, and is cut off on the north and south by steep ravines ; only on the west side it needed a fortified wall, and there was no gateway in that. The inner end of the north ravine curled round, cutting into the north-west corner of the hill. Suspecting that this must have been the line of approach, we cleared down into the watercourse, and found the large blocks of limestone which formed the

foundations of the gateway. This gate was placed askew across the ravine; thus only a few men could approach the gate at once, and there was not any room to work a battering-ram. It was an ingenious form of defence, which has also been found elsewhere in Palestine.

Much of our work has been devoted to cemeteries of large extent. Four parts of this wide field have been opened up, and tombs ranging from 500 back to 1700 B.C. have been cleared. The most interesting feature is a row of at least five large complex sepulchres. Each has a stairway descending about ten feet to a subterranean chamber, with benches along the sides and back, on which lie bones crushed by the fall of the roof and rotted by damp, thus reduced to mere chips and dust bedded in hard mud. Much pottery was placed with these, as many as eighty vases—several perfect—in one tomb. They date from the early Philistine age, of about Sety and Rameses II. Half a dozen burials were placed in a single sepulchre, apparently all men in one, and probably all women in another case. The roofs, twelve feet or more in width, being only of marl two or three feet thick, have all fallen in, and the hollow has filled up with blown sand. The whole region has been invaded by a shallow sand dune, covering the old surface with a foot or two, or up to a dozen feet in depth. This has to be removed before any of the tombs can be traced, so in many instances it is scarcely worth while to pursue the search. From these, and from tombs reaching back to the Hyksos times, there will be a fine instructive series of pottery and other things—painted vases and metal objects—to represent the civilisation of Palestine, as yet so little understood.

FLINDERS PETRIE.

The Daily Telegraph sent out a special correspondent, Rev. C. B. Mortlock, to Palestine this winter, to study various excavations and report on the progress of archaeological research. A long series of articles entitled "The Bible and the Spade," excellently illustrated, is being published every Saturday in that paper, as a result of his investigations. It was heralded in the autumn by a series on Biblical research by Sir Flinders Petrie, Sir Charles Marston, Prof. Sayce, Prof. Langdon, and others. The present series began on February 2, 1929, with a historical introduction, succeeded by an article, the following week, dealing with the site of Beth-pelet and the discoveries there, with striking photographs of the imposing *tell* (*The Daily Telegraph*, February 9, pp. 12 and 16). Descriptions of the fortress site, and of our methods of work, were continued on February 16, when there was also an account of Mr. Crowfoot's own excavations in progress at Jerusalem.

REVIEWS.

Ein Frühgeschichtliches Gräberfeld bei Abusir. By Hans Bonnet. 4to. 60 pp., 38 pls., 21 figs. (Leipzig : Hinrichs.) 1928.

This work describes the results of clearing a cemetery at Abusir, presumably near Saqqareh, which much resembled those known at Tarkhan, Abydos (*Tombs of the Courtiers*), and Bashkatib (*Lahun* II). Such work should, no doubt, extend our knowledge of the earliest dynasties, but to gain any further results the record needs to be very systematic and complete. Unfortunately this is not the case in the present publication. There is no complete register ; out of 65 tombs the contents of only 23 are listed, and that list omits the very rare sandal tray, the tombs with painted Syrian pottery, and the almost unique mirror—the principal objects found. The common pottery is only given in photograph groups, and the distinctions catalogued are " long," " egg-shaped," and " cylindrical." The time scale of degradation fixed by the Royal Tombs' series is ignored. The stone vases are all drawn, however often a type recurs, on 20 plates, which must be hunted through to find the grouping. Even the scale is irrational, " about 1 : $3\frac{1}{2}$ " ; if they had been published like all other series they would have taken 7 plates instead of 20. There is no mention of the skulls and bones found, which require measurement. In short, a fine opportunity of improving the past results has been lost by want of system. There is no necessity to be bound to a previous system if it can be improved on ; but to go back twenty years in method is a thing much to be regretted.

The material plainly extends over the Ist to the middle of the IInd dynasty. Only two inscriptions were found : one on a black cylinder naming the temple of the *ka* of Neit ; the other, of signs on a vase, is unpublished. The most important object is the copper mirror, of a type only once recorded before (*Sedment*, xxii, 3), and much older than the usual ovate form found in Egypt. This pear-shaped form only appears later when the Syrian influence of the XVIIIth dynasty came in, and it seems probable that it was an importation from Syria in the Ist dynasty. The tomb containing it is not catalogued, and there is no mention, in the text, of objects accompanying it. The Sedment example is of the reign of Den, but no further dating is attained here.

The discussion of the period of the graves is disappointing. Comparison piece by piece with dated examples is required, in order to amplify or correct what is known. The vague statements about types of pottery lasting long, cannot be seriously considered without quoting some definite examples, and debating what are the fixed evidences of period in each case. For instance, the Syrian painted vases here are accompanied by a vase, no. 109 (only found by reading over all the plates) ; this is closely like one in *Tarkhan* II, xxvii, 81c, of S.D. 80, or the age of Zet, and similar painted vases were found of the next reign in the tomb of Den (R.T. II, 46). Here these dates confirm each other, though depending on three sites linked together. We may hope that if any other such fine cemeteries are opened, the record will be such as to add as much as possible to our knowledge.

Deyr el-Muharraqeh. By Ugo Monneret de Villard. 8vo. 35 pp., 16 pls. (Milano : *Tipografia Pontificia.*) 1928. N. P.

This is another of this author's excellent studies of Coptic architecture. The deyr is near Manfalut, and identified as Qûsqâm. It has been hitherto neglected, and recent changes have effaced much of its antiquity. The most important buildings in a great enclosure wall are the church and the fort. Abu Salih describes the place, and states that it was restored to its original condition by Sheykh Abu Zakari under Al Hafiz (1131–49). The altar slab is a tombstone, praying "God rest the soul of the blessed Kollouthos buried in the month Khoiak, day 15, indiction 15, year 463" = 747 A.D. ; but this is not connected with the history of the deyr, the feast of which is on 6th Athyr.

The church is divided by four columns into nine squares, of which seven are domed ; a narthex with domes is at the north side. This leads to a discussion of the whole group of domed churches. It was in the 12th century that the flat timber roofs, of the basilica type, were changed for domes, as at St. Menas 1163, St. Mercurios 1175. The reasons suggested are the dangers from fire and white ants. This time was at the close of the Fatimites and the entry of strong Turkish influence from Iraq. Hence there is much force in the comparison of the domed roofs with the domes and hemicycles of the church at Rusafa of 569–82, and the similar design at Gire in Fars of Sassanide work, 399–428. The latter in turn is considered to be derived from the fire-temple type. The domed roofing came west to Monte Cassino in 778–97, to France at Germigny les Près 806, to Milan at S. Satiro 875, and in Spain 980. In Armenia it appears in 628–40, and in the Balkans in the 10th century. In Syria it became usual between 1080 and 1190, as in Egypt. Seven of the plans are given for comparison. This is an excellent slice of the later history, but what of the earlier ? Of the XVIIth dynasty there is a domed tomb at Qurneh, and what of the domed recess in the earliest buildings at Ur ? What of the domed hemicycle so constant in Imperial Rome ?

The other important building is the keep, which is 54 feet high and 34 feet square. It is entered, at 18 feet up, by a door with a drawbridge which was reached by a small secondary tower with a staircase. Thus on raising the drawbridge there was no entry to attack below 18 feet. Such towers are also referred to Syrian influence. There are no less than five plans of the different levels and seven whole-height vertical sections in different aspects, rendering very full details of the doors, windows, and roofing. The plans of ten other convent towers are given for comparison. The work, though brief, is essential for the comparative study of architecture of the mediaeval period, and we owe much to the fine plans of the series of M. Monneret.

L'Arithmétique au moyen Empire. O. Gillain. 8vo. 324 pp. Bruxelles, 1927. (Fondation Reine Elisabeth.) N. P.

The mathematics of the Egyptians may be regarded from various points of view. M. Gillain is concerned with the arithmetical view, which is the most evident, and concludes with the subject of the conceptions of number and processes.

Before we reach that stage, however, there is another point of view, that of the historic origin and growth of the science, for which we may have some regard, as it explains the method. The earliest need of number and quantity is in the

division of food, and problems about food are the most usual in the papyri. A common sight in the plains of Egypt is a party of men all sowing in the Nile mud. They are out all day, and have a sack of little loaves sent with them; how much is each man to have? There may be 35 loaves in the sack to share among 12 men. Each will have 2 loaves, and 11 are left over; each will next have 1/2 a loaf, and 5 are left; each takes 1/4, and 2 are left; lastly, each takes a 1/6. As a matter of arithmetic it is simpler to say 2 11/12, but as a practical division of food in the field the best line is by 2 + 1/2 + 1/4 + 1/6, and such was the Egyptian's way, which became rooted in his mind. It is just the method of distributing shares of money in a Scottish fishing crew. Another frequent problem was to divide a quantity of food or land in some fixed proportion, as when an elder brother took a larger share than others. The method was to add the relative proportions on any basis; then the actual quantity divided by the sum of the proportions showed how to multiply each proportion to find the true amount. Strange as the approximation by piecing a result together may seem to us, we yet apply the same method in our long division, subtracting a simple multiple, taking the residue, and subtracting another multiple for the next decimal place. In other ways the prominence of the food basis appears, as in the many problems about the contents of granaries, which form the starting point for methods of cubic measure, and involve the area of a circle.

Upon this utilitarian basis there was not much growth of the abstract ideas. The division of a quantity into equal shares was extended into shares in arithmetical progression, and other series. The idea of a series of powers was begun with powers of 7 up to 16807: further, the properties of the sum of a series were in view. How much further theoretical mathematics may have extended is not shown by the very few documents that have come down to us. It should be noted that as the problems of the Rhind papyrus deal entirely with fractional amounts it should be regarded as a manual of fractions, and all that may have existed of the science of integral numbers is lost to us, except the one instance of powers of seven.

The book before us opens with an introduction describing the sources of information. The methods of working are next fully detailed. Addition of fractions was done by reducing them all to a common denominator and adding the numerators; or sometimes not to the full denominator, but a factor of it, and stating the numerator with a fraction. The necessity of using only numerator 1 led to expressing 6/7 as 1/2 + 1/4 + 1/14 + 1/28; it was this lack of notation which kept the Egyptian back. Subtraction of B from A was regarded as finding C, which added to B would make A. To subtract 2/3 + 1/15 from 1, the difference, 9/30, is reduced to 1/5 + 1/10. Multiplication by a compound fraction was done by using each term separately, and adding the products. Division was managed by inverting the fractional divider, and using it as a multiplier.

As we need to use tables of multiples, either in print or in the memory, so the Egyptian required long tables, and many of them, for the decomposition of fractions having larger numerators than 1. Thus 2 ÷ 29 is 1/24 + 1/58 + 1/174 + 1/232, or as we should write it (29 + 12 + 4 + 3) ÷ 696, or 48/696. Such was the fatal hold that the primitive food division retained in the structure of the Egyptian mind; the line of national thought had grown in that way, and could not outstep it. When we look at the cumbrousness of numbers in Greek

or Roman notation, or even at the limitations of expression in Newton's time, it is evident how thoughtlessly dependent we are on the invention of facilities of expression, as well as of thought.

The problems quoted and analysed are examples of the general principles of working stated above. The highest point in natural constants is the ratio of circumference to diameter. This is involved in finding the area of a circle, and the Egyptian by some practical means hit on the very convenient rule that a circle of 9 diameter is equal to a square of 8. This implies that the ratio of radius to circle is $9^2 : 16^2$, or 81 : 256. This, instead of the true 3·1416, gives 3·1605. The actual casing of the Great Pyramid gives 3·142, and it is clear (from the multiples of the cubit) that it was set out by the ratio 22 : 7, or 3·1428 ; the 9 and 8 method, therefore, was not the limit of knowledge, but only a convenient simple rule. Another great constant, the ratio of diagonal to side of square, the Egyptian took to his bosom by adopting both side and diagonal units for a double system of measure, especially for land, without ever attempting an equation between them.

We can but congratulate M. Gillain on his thorough discussion of the groundwork of the ideas and methods of the Egyptians, and echo Sir Thomas Heath's opinion that this is "a thoroughly sound exposition of the subject."

While naming the approximation to the radius : circle by $9^2 : 16^2$, it may be noted that this is one instance out of two series of such approximations. To the $9^2 : 16^2$ there naturally follow the series of multiples $18^2 : 32^2$, $27^2 : 48^2$, etc. ; and another series starts with—

$$4^2 : 7^2 = 3\cdot06250$$
$$13^2 : 23^2 = 3\cdot130178$$
$$22^2 : 39^2 = 3\cdot142562$$
$$31^2 : 55^2 = 3\cdot147763$$
$$\text{etc.},$$

that is to say, the faulty first ratio is amended by adding the $9^2 : 16^2$ until it passes the true value 3·14159265, leaving $22^2 : 39^2$ as a good approximation ; though this is not equal to the marvellous 113 : 355 = 3·14159292, only a ten-millionth too much.

JOURNALS.

Bulletin of the Museum of Fine Arts, Boston, Oct., 1928.

REISNER, G. A.—*The empty sarcophagus of the Mother of Cheops.* This account of the final clearance of the tomb of Hetep-heres occupies 13 pp., with many illustrations. The opening of the alabaster sarcophagus was witnessed by five high officials and three of the staff ; unhappily it proved entirely empty, but a discoloration showed that it had been used. It was later removed safely to Cairo. A filled-up pit in the floor was cleared out, and proved to be a shaft descending to a chamber several metres lower, but this had never been used. A blocked-up recess in the side of the upper chamber was then opened. It seems to have been left unfinished, only the ceiling and upper part being smoothed, and the rest of an intended chamber left in the solid. These two unfinished extensions show that the work was hurried at the last and could not be completed before the burial. In the closed recess stood the alabaster canopic box, of the same polished work as the sarcophagus. In it were packets of the internal organs, and in two of the four compartments was a solution of natron. This is an earlier instance of such liquid preservative than that found in the canopic box of Sat-hathor-ant (*Lahun* I, 20). From all the details, Dr. Reisner has gradually reconstructed the crime of the destruction of the queen's body. Yet, after all, may the preservation of the body have been separate from the hiding of the furniture ? May the body still be in some unnamed unmarked deposit ? If it had been broken up, at least some pieces would have been put into the sarcophagus.

The very minute care taken in recording every object and its position has made it possible to reconstruct the perished woodwork, and place the gold inlay hieroglyphs and gold casing into their original relations. Thus the carrying chair and the baldacchino stand now in the Cairo Museum as they originally appeared, and a copy in gilded wood has been executed for Boston. Also in Cairo there are a large alabaster jar, the set of toilet vases, other alabaster vases, the copper basin and ewer, the canopic chest, gold drinking-cup, gold saucers and razors, beside flint razors. The workmen had left behind five copper chisels or points from their work, also now in Cairo. So ends the most laborious piece of preservation and reconstruction, and we may hope that Dr. Reisner will now be able to devote himself to the permanent record of all his work in Egypt, without which the scientific value of it will vanish. It is pleasant to us to note that a former worker of the British School at Qau, Lt.-Commander Wheeler, was the principal assistant in all the above work. The other assistant was another Englishman, the late Mr. Dunham, whose death is a recent loss to archaeology.

Bulletin of the Cleveland Museum of Art. Oct., 1928.

This gives photographs of a Greek necklace with ball beads covered with very minute granulated patterns, the gold globules being only 1/75th inch wide, perfectly spaced and adjusted.

Journal of Roman Studies. 1927.

MILNE, J. G.—*The ruin of Egypt by Roman mismanagement.* This is a valuable summary of the economic causes of ruin in Egypt. The earlier Ptolemies had managed finance through the Greek colonists; later the Greeks were mixed with Levantines and management became corrupt. The kings only got a diminishing revenue and borrowed heavily to bribe Rome: but the inhabitants did not show distress. Augustus took over the country "the tenants of which had for some generations been left to manage it for their own benefit: the nominal owners had been practically bankrupt, though the property in itself was perfectly solvent." The Ptolemies had taxed by corn and by monopolies. Augustus kept up the corn tax, but exported it all; he abolished the monopolies in the interests of Roman merchants, but taxed the traders. A poll-tax was also established, theoretically as equivalent to military service. The Roman policy was at every turn to take possession of the land, and for this the temple lands were confiscated and the priests paid salaries as servants of Rome. This policy, like Ismail's, is fatal to success, and now Fuad has reversed it and is dividing Crown lands among the peasantry. The middle classes were oppressed by being made responsible, not only for the pence—as in England—but also for collecting all the taxes. "Before the end of the 1st century the pauperisation of the middle classes must have been fairly complete: the stores of capital which they had accumulated under the later Ptolemies had been exhausted, and, as there was no more to be squeezed out of them, the pressure was transferred to the actual cultivators of the soil." This is a lesson for England in the prospects of taxation. The revolts followed, villages were completely ruined under their burdens by 200 A.D. Bands of men lived by brigandage, and the picture of this is in the Theagenes and Chariclea of Heliodoros.

During the 3rd century the country decayed, currency vanished before barter, and no one would take up public work. Diocletian tried to clean up the Empire by a stiff official management, and made Egypt free to use the Roman currency. But this was too late, the flood of depreciation went on to meet the prices forced up by rival trade unions (*see* ANCIENT EGYPT, 1922, p. 105). Under Constantine nearly all the inhabitants of a village had fled, and only three out of twenty-five were left to pay taxes. In the 4th century a kind of feudalism arose, when a community put itself under the protection of a wealthy man, who could stand up against the government, raise his own local forces, and even issue his own currency. In the end the Arab invaders were often welcomed, much as the Gaulish proprietors preferred to give part of their land to the Goths and have done with the tax-gatherer. It is a melancholy thing that all this ruin was brought about, and the government committed Rome to further ruin by pauperising a useless people with doles.

Archaeological Research on the Ancient Lolang District. By T. SEKINO, S. YATSUI, S. KURIYAMA, T. OBA, K. OGAWA, T. NOMORI. Sm. folio. 2 vols. 1925. (Government General of Chosen.)

This is another fine publication of plates, which does honour to the archaeological school of Japan, and the number of writers here will show how well it is spreading. Contact with the West is shown in the forms of wide-bladed arrow-heads, exactly like some brought by the Scythian invasion to Palestine and Egypt. We only regret that we cannot enter at length on so interesting a field of study.

NOTES AND NEWS.

THE first number of ANCIENT EGYPT for 1929 will contain a more detailed account of our excavations at Beth-peleth (Tell Fara), now in progress. These will probably be continued during the ensuing season.

We also hope to issue short summaries of the archaeological work of various bodies in the season now drawing to a close, and beg that the excavators will send information in time. We hesitate to issue accounts at second-hand, as rumours are so abundant in the outskirts of archaeology, but direct news will always be welcome from the various British diggings, E.E.S., P.E.F., B.S.A.J., etc., the expeditions in Mesopotamia, India, and other outposts, and the campaigns of our American colleagues in the East.

Exhibitions of antiquities in July—one or more of which have always been held annually since Flinders Petrie's first exhibition in 1884—have proved a source of interest, and of training in archaeology, to the general public, and their interest has been sustained lately at other times of year by other exhibitions, notably those wonderful collections from Ur of the Chaldees.

In the room at University College where we generally hold the annual exhibition of the British School, there has lately been an exhibition showing results of various excavations in Great Britain; we welcome this new development.

An apology is owed to our subscribers and readers for the late appearance of this fourth part of ANCIENT EGYPT. The delays in issuing parts iii and iv were due to a fire which broke out at the block-makers, and hindered the preparation of plates. Subscriptions for 1929 may now be sent to Lady Petrie. The payment of ten shillings entitles the subscriber to be an Associate of the British School of Archaeology in Egypt, and to receive the *Journal* post free. Membership of the School is obtained by sending one guinea, or two guineas, for which a volume, or a double volume, is given. For seven shillings, ANCIENT EGYPT is sent. One cheque covers both subscriptions. Many subscribers are now including an additional donation, that the excavation of Beth-peleth may go forward unhindered.

RECENT DISCOVERIES, BY THE BRITISH SCHOOL OF ARCHAEOLOGY IN EGYPT, AT BETH-PELETH.

A LANTERN LECTURE on the results of the season will be given by Sir Flinders Petrie, at University College, Gower Street, on

Thursday, May 23, at 2.30, repeated on
Friday, May 31, at 5.30,
Saturday, June 1, at 3.

The lecture is open to the public, without fee or ticket.

The Annual Exhibition of Antiquities will be open from July 8 to 27, from 10 to 5 daily, and on two evenings, July 10 and 20, from 6.30 to 8.30.

NO NOTICES OF THE EXHIBITION WILL BE SENT,

but there will be reminders instead, in the daily press.